For the public, with the public, by the public: George Wilson and the Edinburgh Industrial University Museum

KLAUS STAUBERMANN

Abstract

University museums have played a significant role in the development of science and engineering knowledge for a long time. The first professorship of technology at Edinburgh University was synonymous with the position of curator of the university's newly founded Industrial Museum. The unique approach of George Wilson, who held the first technology professorship at Edinburgh University in the 1850s, was to perceive the museum as an active mediator in the understanding of materials, techniques and processes. Artifacts for him were instrumental in the transmission of contemporary knowledge. Interaction with audiences in return enabled museum curators to build both collections and expertise. The examination of these historic practices today helps us to expand our own understanding of public engagement in museums.

For the public

The focus of this paper will be on artifacts. The role of artifacts in the making of technical knowledge has received growing attention over the past few decades. Artifacts have been studied both in the context of museum collections and increasingly in the context of their disciplines or broader cultural contexts. Artifacts are an expression of cultural practices but they also transform cultural practices. In education, the many uses of artifacts can range from simple representations to complex research tools. Artifacts can also change their use over time, for example from teaching tool to decorative item. This paper looks at specific types of artifacts in the museum context and how the uses and perceptions of these artifacts have changed over time.[1]

The idea to display and illustrate artifacts and processes of manufacture at a Scottish Industrial Museum dates back to Edinburgh University's first professor of technology and museum director, George Wilson. Wilson had intended to educate the public in crafts such as glass-making, gun powder-making or candle-making. His background was in chemistry but he wanted to present and interpret all branches of technology in his museum. Wilson had been a lecturer before his appointment as professor of technology and had aimed taught students – academic and non-academic – of both genders, as well as working people.[2]

In his inaugural lecture Wilson outlined:

> "An Industrial Museum is intended to be the repository for all objects of useful art, including the raw materials with which each article deals, the finished products into which it converts them, drawings and diagrams explanatory of the process through which it puts these materials, models or examples of the machinery with which it prepares and fashions them, and the tools which specially belong to development and analogies, and the social context of production and use." (WILSON 1855)

Unfortunately, Wilson died in 1859, four years after he was appointed and had delivered his outline of a new industrial museum for Scotland. However, many of Wilson's ideas, such as a public laboratory and workshop were realized.[3] The first steps towards educational displays in this university museum

[1] See, for example, DE CHADAREVIAN & HOPWOOD 2004, or SCHAFFER 1994.

[2] SWINNEY, G. 2008. *Placing and materialising industry and technology – George Wilson (1812–1859) and the establishment of new spaces of intellectual endeavour*. National Museums Scotland Research Repository.

[3] Such developments were of course not limited to Edinburgh and should be seen in the broader context of creating teaching apparatus at educational institutions in the 19th century. There is a broader political narrative to be told, which I want to skip here, about the creation of science and industry museums in Britain during the 19th century, the significance of the Parliament's

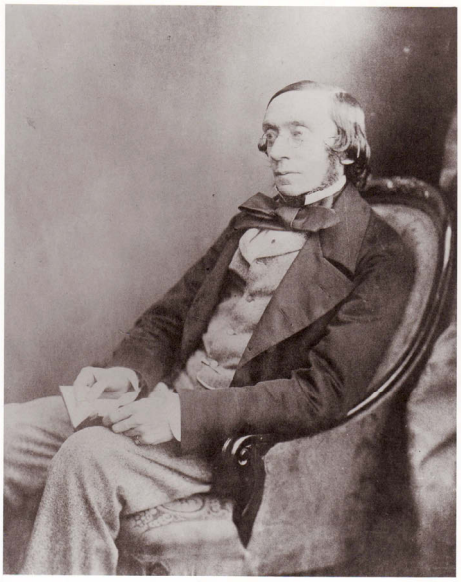

Fig. 1 - George Wilson, the first director of Edinburgh University's Industrial Museum © Trustees of National Museums Scotland

had been modest. The museum's first annual reports give us an insight into the development of both early engineering model making and the model-making workshop. The report of 1858, for example, published shortly after the opening of the museum, lists working models and machines as part of a small exhibition on manufacturing. Models as well as original artifacts at that time were either donated to the Museum or purchased. These were models of furnaces, steam engines as well as models of tools and manufactured products.

These models were not limited to Scottish manufacture and included, for example, a Chinese loom and a rice mill. Scottish companies and firms were in support of the new museum and donated models or sold them at a reasonable rate. However, ten years later the museum had already furnished its own model-making workshop and had its first model-maker. The museum's annual report of that time states that the museum's first curator and accountant Mr. Galletly, besides his various other duties, had superintended the making of an impressive series of models. The models produced in the museum workshop were intended to represent the latest technical innovations. The museum's annual report of 1868 states:

> "In the Industrial Department a very interesting and valuable series of models of some of the most useful machines, such as the steam hammer, steam winch, hydraulic ram, metallurgical apparatus etc. have been made under the direction of Mr. Galletly, who is specially qualified for the work; and these have been found of great value to students of engineering" (ROYAL SCOTTISH MUSEUM 1868, 5).

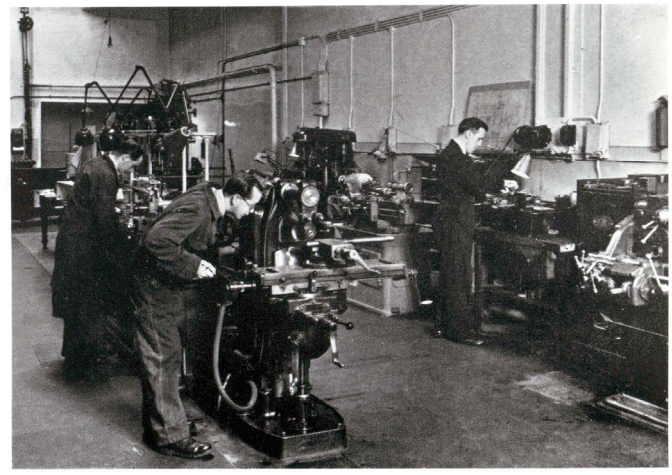

Fig. 2 - The Royal Museum's Technology Workshop where large numbers of engineering models were produced © Trustees of National Museums Scotland

Models became not only more complex, they also became bigger. The Industrial Museum's workshop exercised its newly acquired skills on a model of a 50 ton steam crane, a turbine section, a Corliss-engine, a zinc smelting furnace and a Siemens regenerative gas furnace. Reasons for commissioning or building a model could vary: sometimes it would made because of an invention that caused public attention, like the hydro-pneumatic gun carriage put into service in 1888 and built as a museum model in 1891 or the Temple opening bridge in Glasgow, opened in 1931 and built as a model in the 1930s, although not completed till after the Second

Museum and Library Act of 1850, the importance of the Great Exhibition of 1851, and growing British concerns about international competition during this time. The foundation of the Industrial Museum at Edinburgh University must be seen in this context. See e.g. An Act for enabling Town Councils to establish Public Libraries and Museums, August 14, 1850. Parliamentary Archives, Houses of Parliament, London.

World War. Sometimes a model could be built for an exhibition or because it formed part of the university or college teaching curriculum.[4]

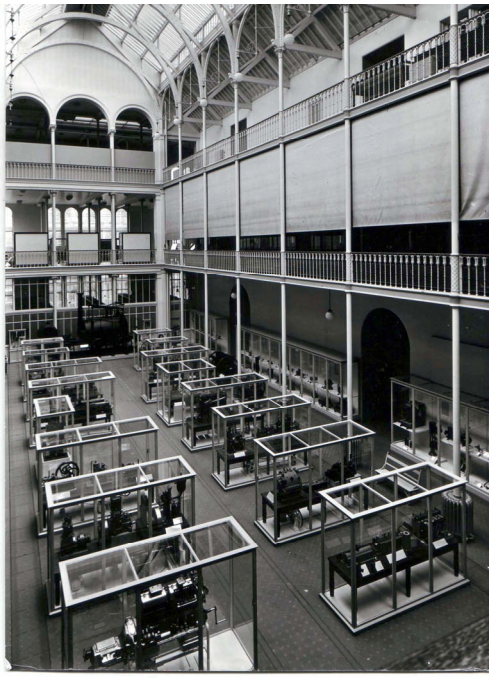

Fig. 3 - The Royal Museum's engineering galleries as they would have appeared for most of the 20th century © Trustees of National Museums Scotland

Alexander Hutchieson, Keeper of the Department of Technology at the time of the Royal Museum's 100th anniversary, summarized:

"Before his death, George Wilson had made provision for a technological workshop, which was formally instituted in the year 1866 for the purpose of making instructional models and specimens for display in the industrial sections. This has proved a most valuable asset of increasing importance throughout the history of technology in the Museum. Freed from the harassing effects of commercial production, successive teams of highly skilled craftsmen have over the years not only furnished useful re-creations of the more important developments in the history of technology, which could have been provided in no other way, but they have built up a school of model-making which has become a museum tradition" (ALLAN 1954, 42–43).

A visitor to the museum in the late nineteenth or early twentieth century would have found a museum with a display of perhaps several hundred engineering models, with original machines in between and framed by impressive ship models. With the introduction of electricity many models had been designed as push-button models, rendering movements and processes more visible. However, for a museum visitor in the second half of the twentieth century the picture looked very different: only very occasionally a scale model would be built and by the end of the 1970s the Royal Museum's model-workshop was finally closed (WOOD 2000).[5]

Changing experiences

How can this decline of educational models and model making in museum be explained? Did artifacts become too complex to be displayed through models? Or did the model loose out again another ways of educational display? The factor that probably most affected the role of models in the museum is the development of the science center movement. From the 1930s onwards first scholars and then museum increasingly promoted the role of authentic experiences and interaction in education. The first museums to employ this new approach were open-air museums. However, soon this new approach spread to science and in 1937 the Palais de la Découverte in Paris, the first modern science museum, was opened. The post-war period of the 1950s and 1960s marked a period of experimentation for exhibition designers and as one result in 1969 the first science center was founded, the Exploratorium in San Francisco (KONHÄUSER 2004). Scientific phenomena could be imbedded in an interactive so that every visitor could share the same experience. These experiences were thought to be more interesting and stimulating than simply watching a model.

However, this new demand for action and practice did not remain unnoticed by model makers. Although models did not furnish the visitor with a practical experience, practice could be displayed

[4] Movie: HARPER A. ca. 1938. *Royal Scottish Museum*. Edinburgh: National Museums Scotland, 069 (411) Edi. RSM/E.
[5] WOOD 2000, 79. This can be seen as part of a wider trend of model-making workshop closures in the 1970s. See, for example, ANDRÉ & DIGEON 2006.

through models to a certain extend. Model-makers responded by building even more authentic models. They increased attention to detail, thereby making the model appear more realistic. Sophisticated section models enabled the visitor to explore the inner life of a machine. Larger than life models helped to understand details and working models of course could help to understanding the functioning of a device. Often, a model-maker would add a scale worker or machinist to the model to demonstrate how a machine would be manipulated. Often these engineering-models would be accompanied by texts, diagrams and even dioramas. And last but not least, models could be demonstrated by museum-guides, thereby animate both subject and machine.

Fig. 4 - The museum's current engineering displays include a restored and partly working eighteenth century Boulton and Watt engine © Trustees of National Museums Scotland

Fig. 5 - A restored and working early twentieth century traction engine which is used as part of the museum's outreach events © Trustees of National Museums Scotland

There is a fundamental difference to be made between animated models and interactives: whereas a model demonstrates the working of a machine, an interactive enables the visitor to actively experience a device. No matter how authentic the model looks and how well the practice that was needed to make it work was demonstrated, the visitor experience still remained largely passive.[6]

Fig. 6 - A model bridge building workshop at the museum, based on original bridge designs and aimed at families © Trustees of National Museums Scotland

On the other hand, an interactive is hardly able to give a visitor the complex experience a machine operator or user would have lived through. Moreover, the design features of a machine that could be demonstrated by a well-crafted model would be reduced to its basic principles by an interactive. It is worthwhile to look how museums respond to this challenge today.[7] Science centers move increasingly away from the demonstration of phenomena and towards the demonstration of processes, often portrayed through history. They draw on

[6] On the idea of experiential learning see, for example MATON-HOWARTH 1990.
[7] The question what knowledge exactly is transferred by means of a three dimensional model has been raised by the philosopher James Griesemer (GRIESEMER 2004).

the experience that visitors enjoy historic artifact experiences, such as object handling sessions or curator's choice talks. The boundary between science centers and museums blurs and science centers increasingly employ historic artifacts to demonstrate that science and technology have a past and are not created at the push of a button. History also helps to understand that progress can be as much about failure as about success. Moreover, looking at social and cultural contexts has become increasingly important for the understanding of science and technology.

Museums today

How does this affect the role of science and technology museums today? One approach that has proved very useful in the public understanding of science and technology over the past years is the re-enactment of historic practices. This can mean the rebuilding of historic apparatus, the practice with replicas or originals but also the re-enactment of historic debates. This approach has become a powerful historiographic tool during the past three decades. The idea of building replicas such as Viking boats or Renaissance telescopes can help us to bridge the gap between the desire for more interactivity and the fascination with the historic artifact as well as contribute to raising questions about social and cultural contexts (STAUBERMANN 2009). Moreover, it allows historians of science and technology to engage both with artifacts and wider audiences.

To summarize I had wanted to look at artifacts, history and education, and how the use of the former changed in the context of newly emerging ideas of interaction and practice in the latter. I have shown that both trends in the museum world as well as scholarly developments determine how we perceive and employ artifacts in education. I hope to have been able to demonstrate that artifacts are witnesses of historic social practices. They can be employed as historiographic probes into museum cultures and societies. And they help us, by drawing cultural trajectories through historic practices, to understand what makes science and technology such a powerful discipline after all.

Literature cited

ALLAN D. 1954. *The Royal Scottish Museum 1854–1954*. Edinburgh: Oliver Boyd Ltd.

ANDRÉ L. & J. DIGEON 2006. L'âge d'or du modèle réduit. *La Revue de Musée des arts et métiers* 45: 24–35.

DE CHADAREVIAN, S. & N. HOPWOOD (eds.) 2004. *Models*. Stanford: Stanford University Press.

GRIESEMER, J. 2004. Three-dimensional model in philosophical perspective. In: *Models,* eds. S. DE CHADAREVIAN & N. HOPWOOD (Stanford: Stanford University Press), 433–442.

KONHÄUSER, S. 2004. *Lernen in Science Centers*. Hamburg: Verlag Dr. Kovač.

MATON-HOWARTH, M. 1990. Knowing objects through an alternative learning system. In: *Objects of Knowledge*, ed. S. PIERCE (London: Athlone Press), 174–203.

ROYAL SCOTTISH MUSEUM 1868. *Annual Report*. Edinburgh: Archives of National Museums Scotland.

SCHAFFER, S. 1994. Machine Philosophy: Demonstration Devices in Georgian Mechanics'. *OSIRIS* 9: 157–182.

STAUBERMANN, K. 2009. Geschichte erleben. *Kultur & Technik* 2: 22–26.

WILSON G. 1855. Inaugural lecture, "What is Technology?" delivered at Edinburgh University on 7 November 1855. *Edinburgh New Philosophical Journal*, new series, 3.

WOOD J. L. 2000. *Scottish engineering: The machine makers*. Edinburgh: NMS Publishing.

Contact

Dr Klaus Staubermann
Principal Curator of Technology
Address: National Museums Scotland, Chambers Street, Edinburgh EH1 1JF, Scotland
E-mail: k.staubermann(at)nms.ac.uk
www.nms.ac.uk